

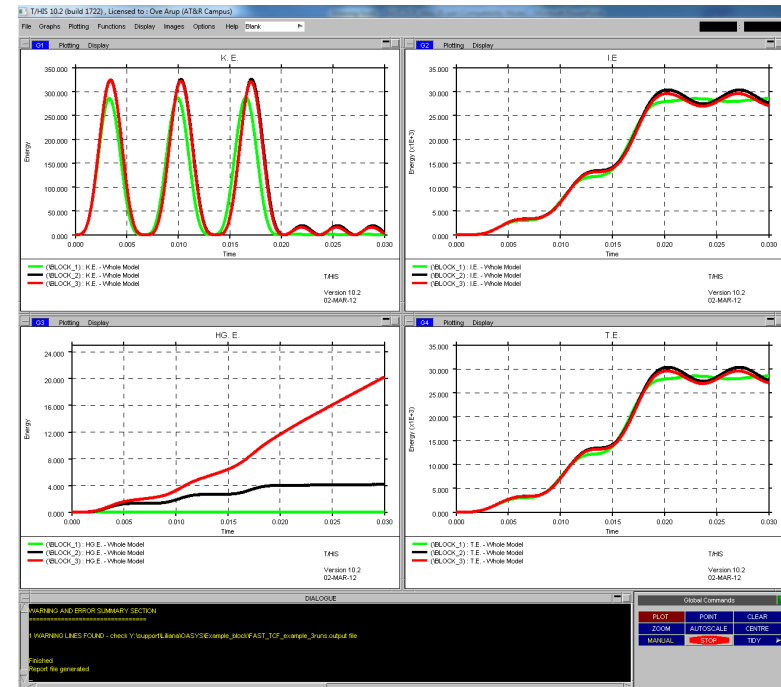
FAST-TCF – Tutorial

March, 2012

Overview



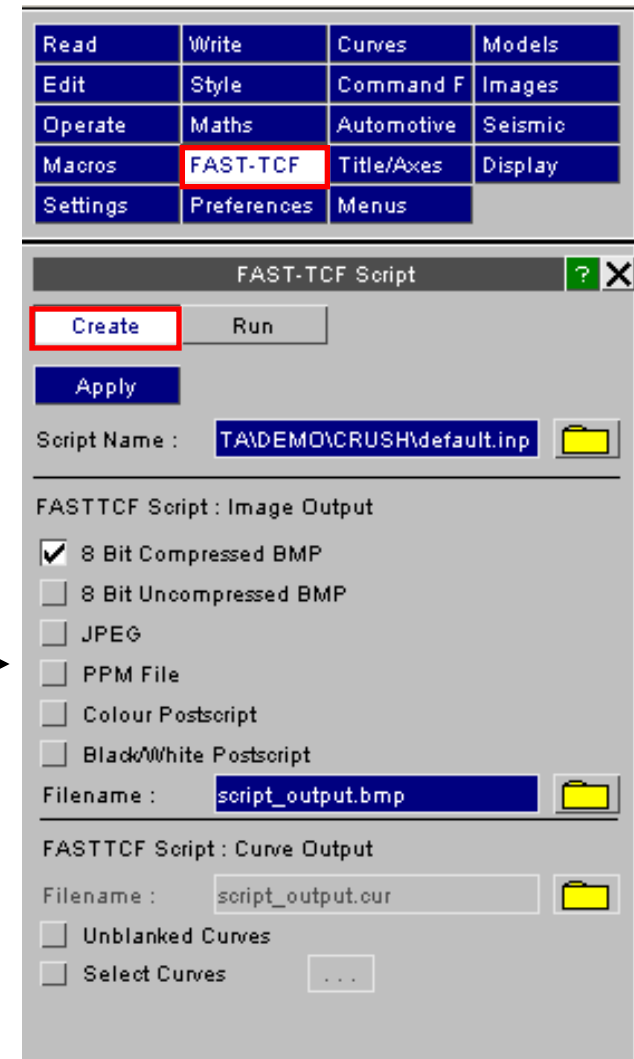
- This document contains a step-by-step tutorial for building a FAST-TCF script that will extract time-history results from three LS-DYNA analyses.
- The results will look similar to the graphs showed here.
- The first few slides that follow contain some general information, followed by the tutorial.
- This document is distributed together with some example files:
 - Runs: BLOCK_1 to BLOCK_4
 - Example FAST-TCF script:
'FAST_TCF_example_3runs_1.inp'



- FAST-TCF is a scripting language for T/HIS, for use with automatic post-processing.
- Scripts are easy to write and edit by hand, and can also be recorded by T/HIS.
- A FAST-TCF script can contain all of the commands to setup and position multiple graphs, read in data, perform curve operations and generate output.

- Automatic generation of FAST-TCF scripts
 - Records operations that created the currently visible curves
 - More robust than command files, not dependent on history
 - Easily editable

Select file type to
be generated by
FAST-TCF script

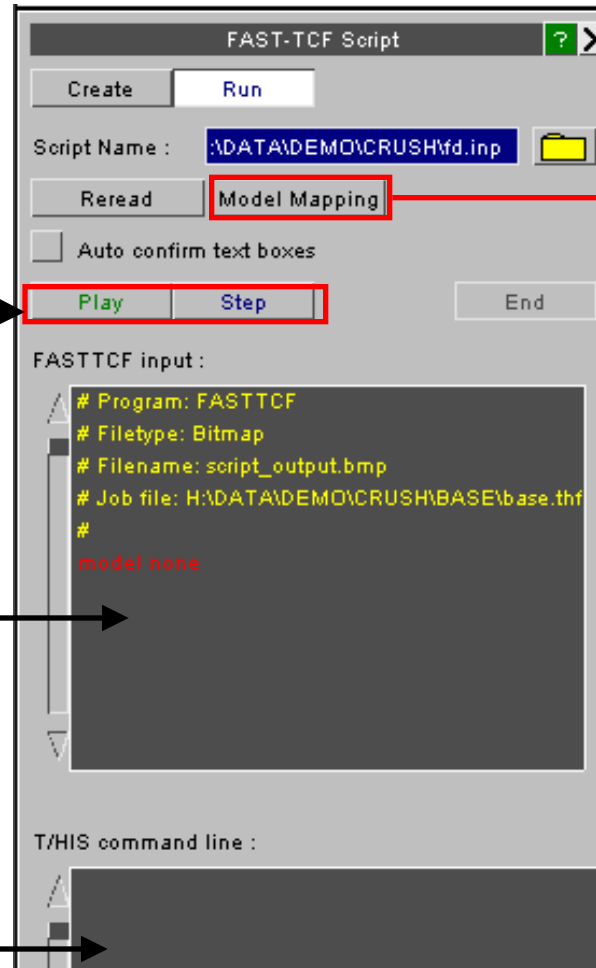


FAST-TCF - Play-back of scripts

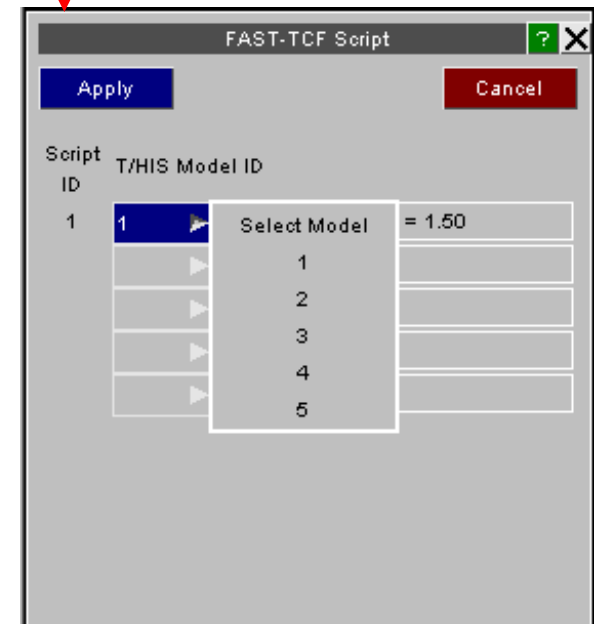
Can be played or stepped through line by line \

FAST-TCF Script

Feedback in interpreter window



- Model Mapping – used with multiple models to define which model in T/HIS corresponds to which model in the script.

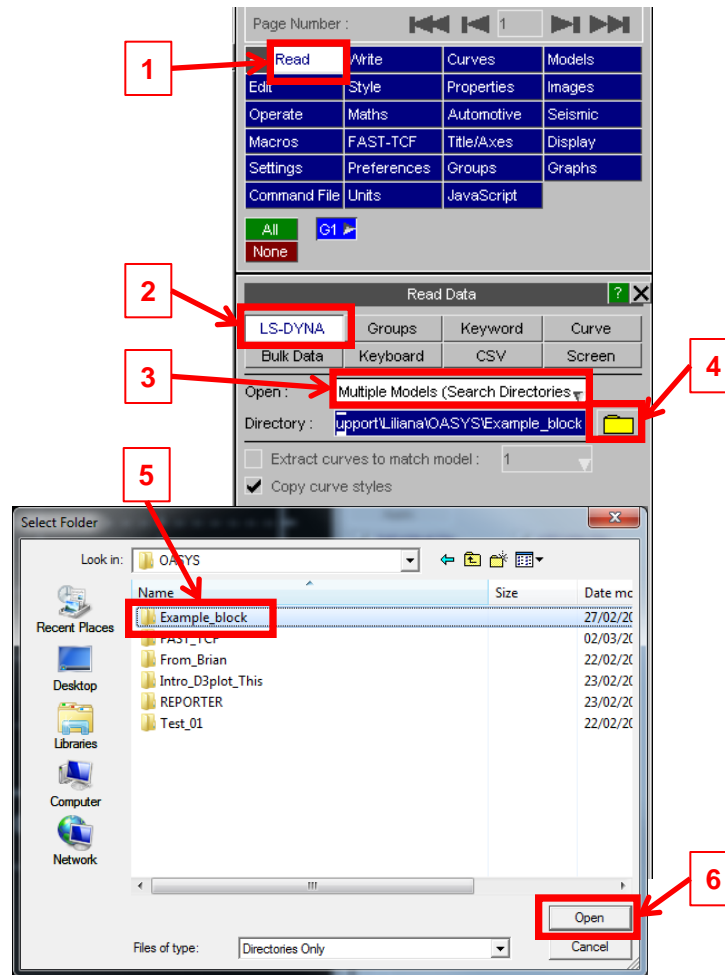
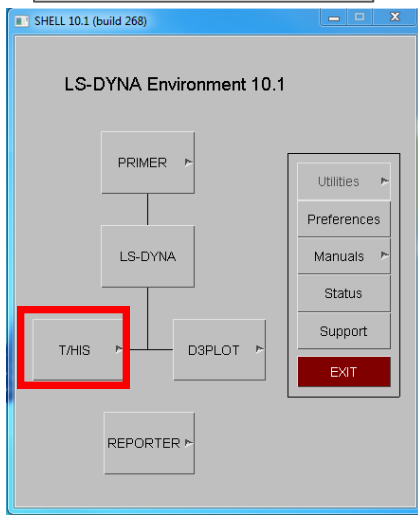


- The following slides contain a step-by-step tutorial, showing an example for building a FAST-TCF script that will extract time-history results from three LS-DYNA analyses.

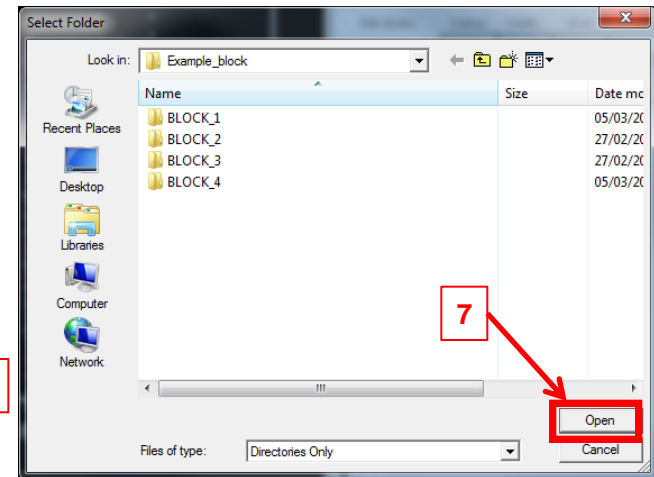
FAST-TCF - Example

- The first step is to open the three models in T/HIS: BLOCK_1, BLOCK_2 and BLOCK_3, follow steps 1-9 (see next slide as well).

Open T/HIS using the Oasys Shell:

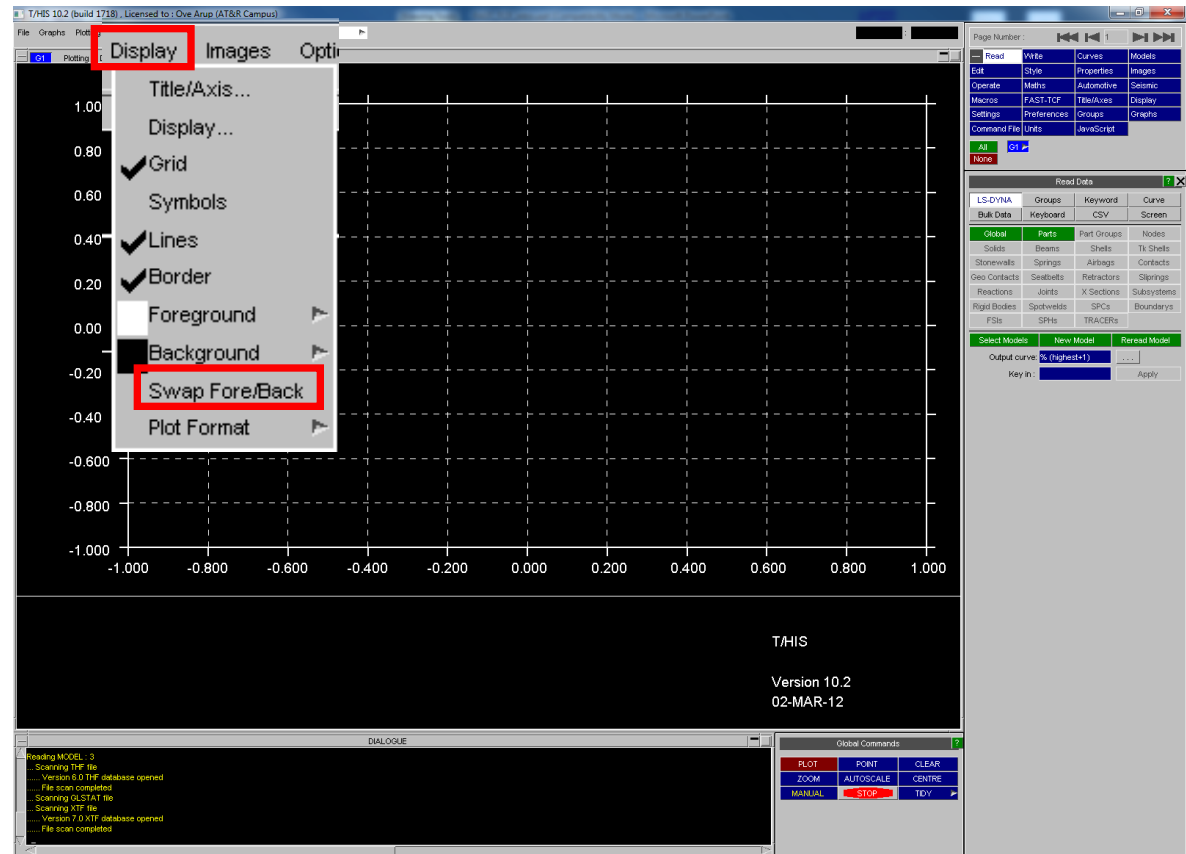
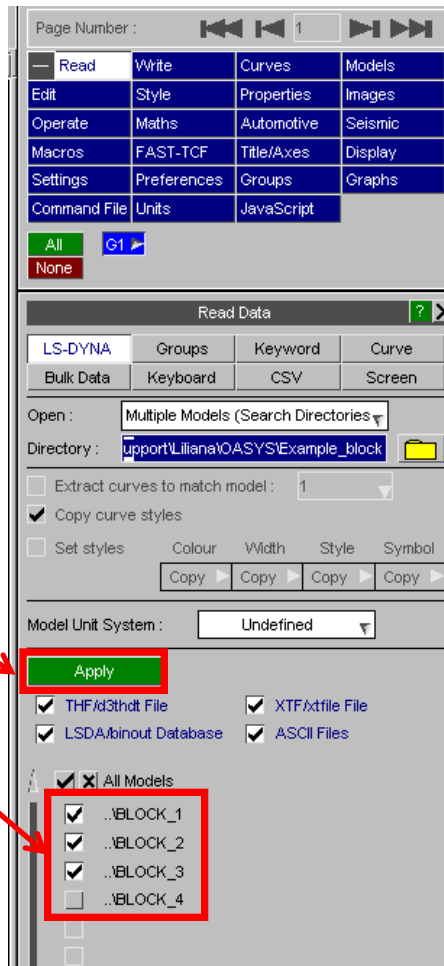


Open the models using 'Multiple Models (Search Directories)' option; alternatively, the models can be read in one by one.



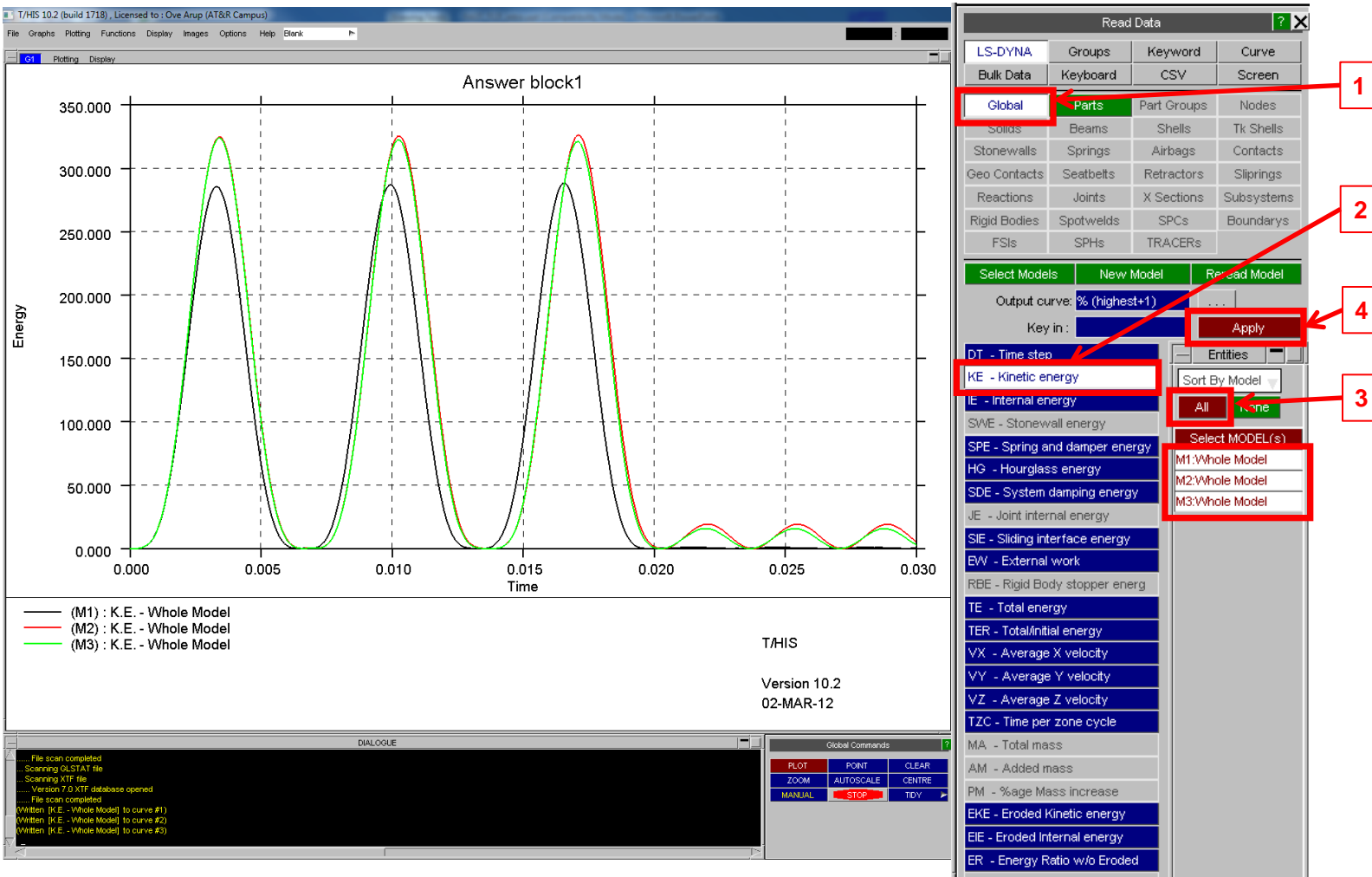
FAST-TCF - Example

The colour of the background in T/HIS is by default black – to change this click on 'Display' -> Swap ForeBack (this can be set in the oa_pref file).



FAST-TCF - Example

- Plot the Kinetic Energy (KE) for the three analyses:



FAST-TCF - Example

- To create another 3 graphs go to Graphs-> Options, tick 2x2 and click 'Create Graphs', repeat 2 more times, then close the Graph Layout panel:

The screenshot illustrates the process of creating multiple graphs in the T/HIS 10.2 software. The interface is divided into several panels:

- Top Panel:** Contains a menu bar with 'File', 'Graphs', 'Plotting', 'Functions', and 'Display'. A red box labeled '1' highlights the 'Graphs' menu, and a red box labeled '2' highlights the 'Options...' option.
- Left Panel:** A 'Graph Layout' panel with a 'Create Graphs(s)' button. A red box labeled '4,5,6' highlights this button. Below it, the 'Number of graphs to create' is set to '1'. The 'Copy settings from graph' checkbox is checked. The 'Automatic Page Layout' section shows the '2 x 2' grid option selected, indicated by a red box labeled '3'.
- Right Panel:** A 'Graphs' panel with a table of graph settings. A red box labeled '7' highlights the 'Create Graphs' button at the bottom of this panel.

An arrow points from the 'Create Graphs(s)' button to the 'Graphs' panel, indicating the next step in the process.

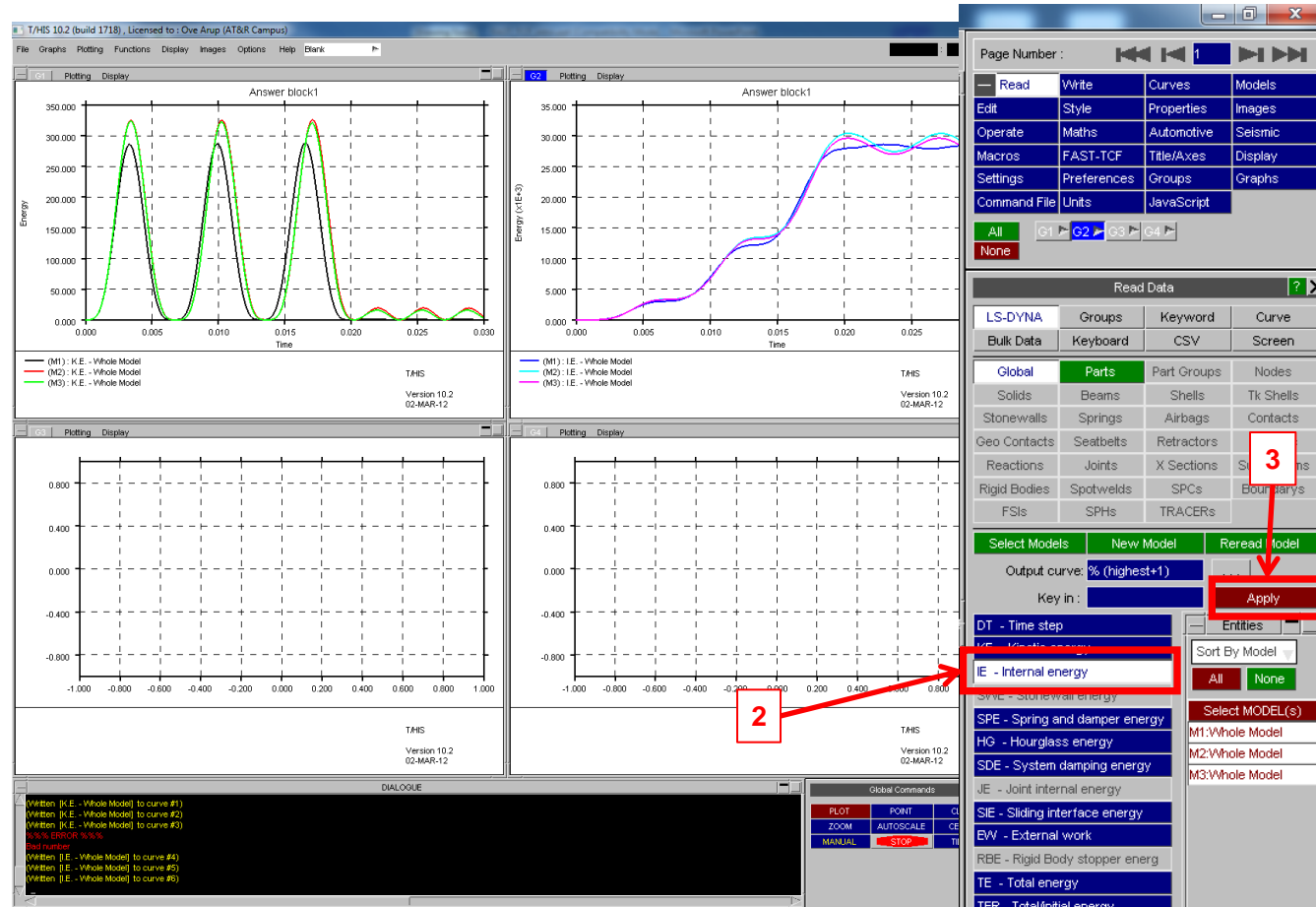
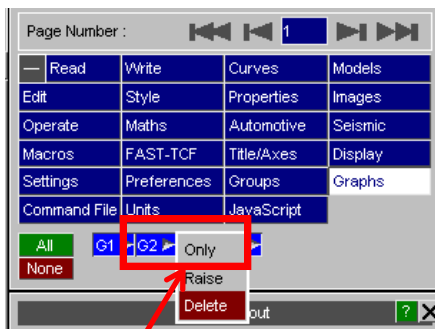
The 'Graphs' panel table is as follows:

Read	Write	Curves	Models
Edit	Style	Properties	Images
Operate	Maths	Automotive	Seismic
Macros	FAST-TCF	Title/Axes	Display
Settings	Preferences	Groups	Graphs
Command File	Units	JavaScript	

FAST-TCF - Example

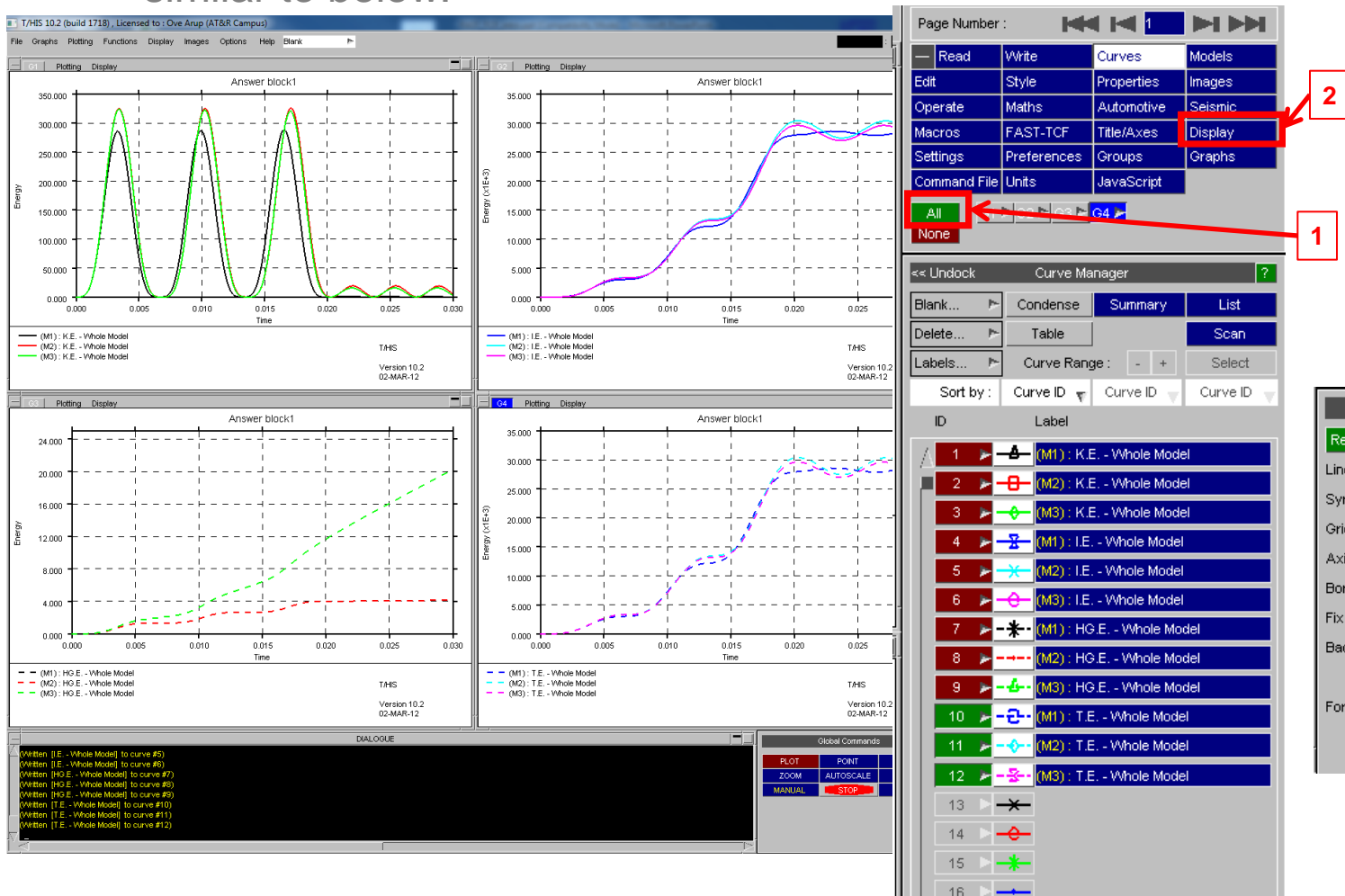
- Read Internal Energy (IE) in the second graph.
- Repeat steps 1-3 to read HG energy in the 3rd graph and TE in the 4th graph.

Make only Graph 2 active: G2->Only

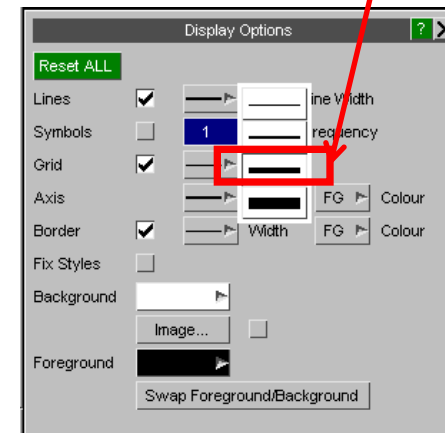


FAST-TCF - Example

- Close the Read Data panel (right corner cross) and the results will look similar to below:



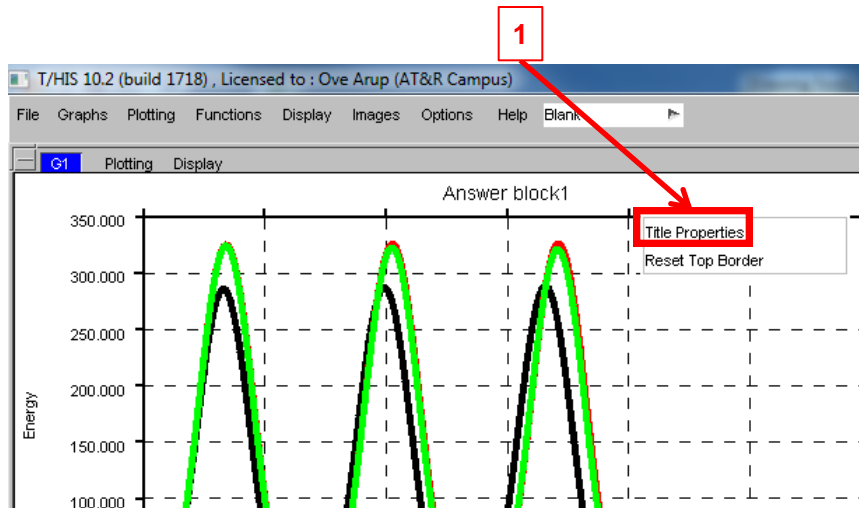
You can change the thickness & style of curves. To make all the curves thicker, first make all graphs active: All; then Display->right click on Line Width->select 3rd line. Close the Display Options panel.



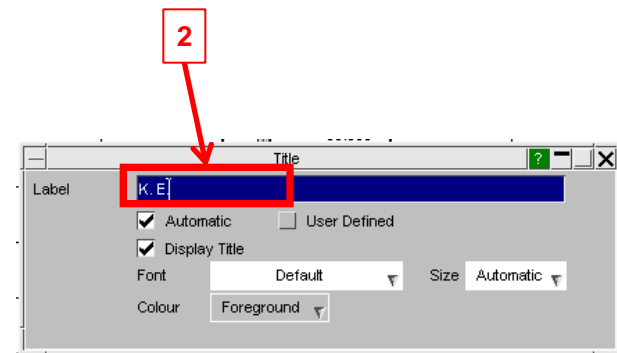
FAST-TCF - Example

- Add titles to each graph:

With the mouse over the top horizontal line of the graph, right click and select 'Title Properties'



Type in the title: K.E. for the first graph. Repeat with appropriate titles for the other graphs.



FAST-TCF - Example

- In this example it would be useful if the curves were coloured by model:

1. Click on the 'Style' menu item in the 'Edit' dropdown.

2. Click on the 'Show Curves' button in the 'Line Style' dialog box.

3. Click on the 'Show Models' button in the 'Line Style' dialog box.

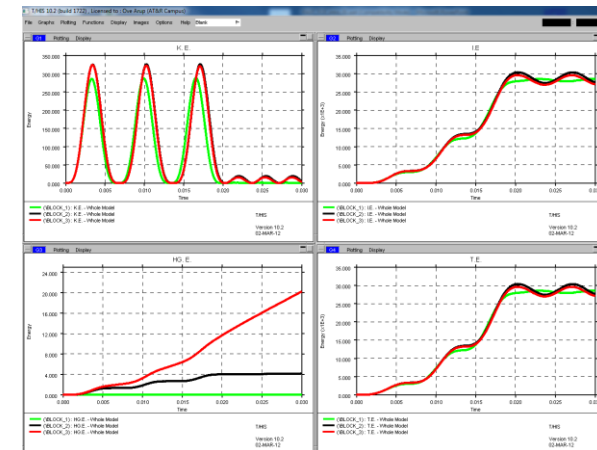
4. Click on the 'Line Style' dialog box to open it.

5. Click on the 'Line Style' dialog box to open it.

6. Click on the 'Apply' button in the 'Line Style' dialog box.

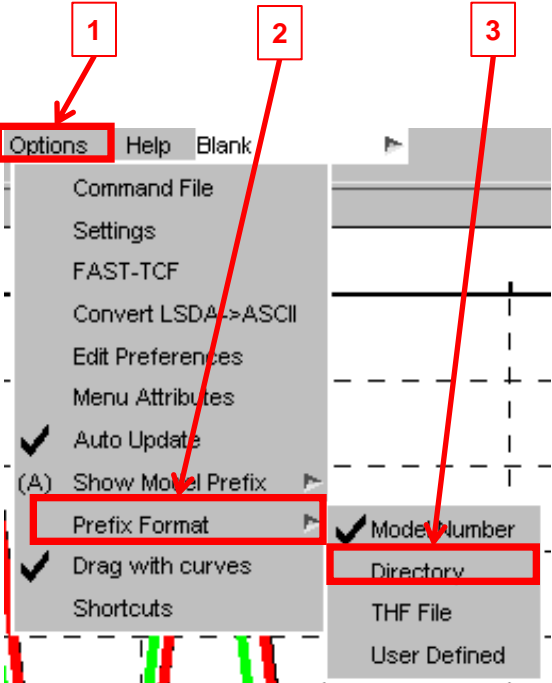
7. Click on the 'Apply' button in the 'Line Style' dialog box.

Repeat steps 4-7 for the other two models: Block 2 and Block 3.



- When comparing several models it is useful to show the run Directory name (by default T/HIS shows Model number). To change this follow the steps below.

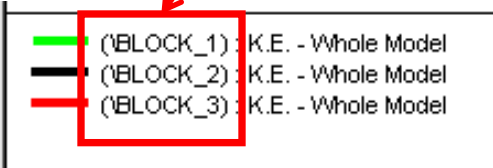
Want to change this:



The screenshot shows the FAST-TCF Options menu. The 'Options' menu is open, and the 'Directory' option is highlighted. The 'Prefix Format' option is also highlighted. The 'Model Number' option is checked. The 'Directory' option is highlighted. The 'THF File' and 'User Defined' options are also visible.

1 Options 2 Prefix Format 3 Directory

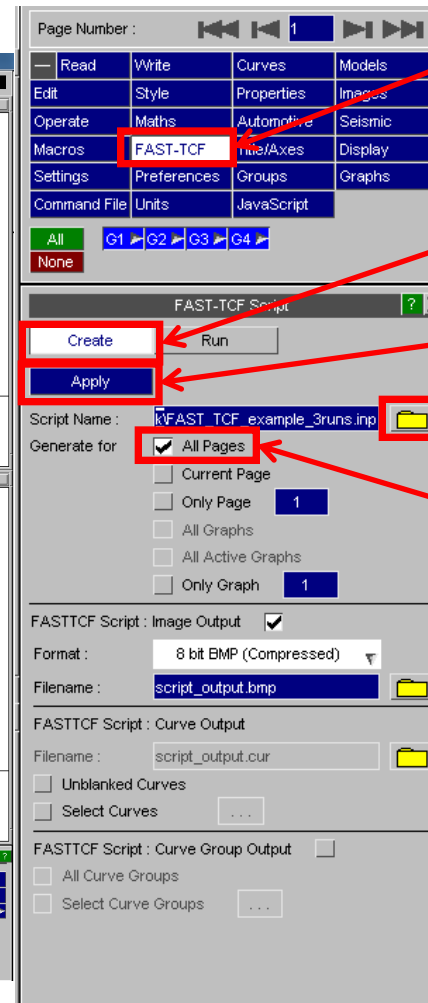
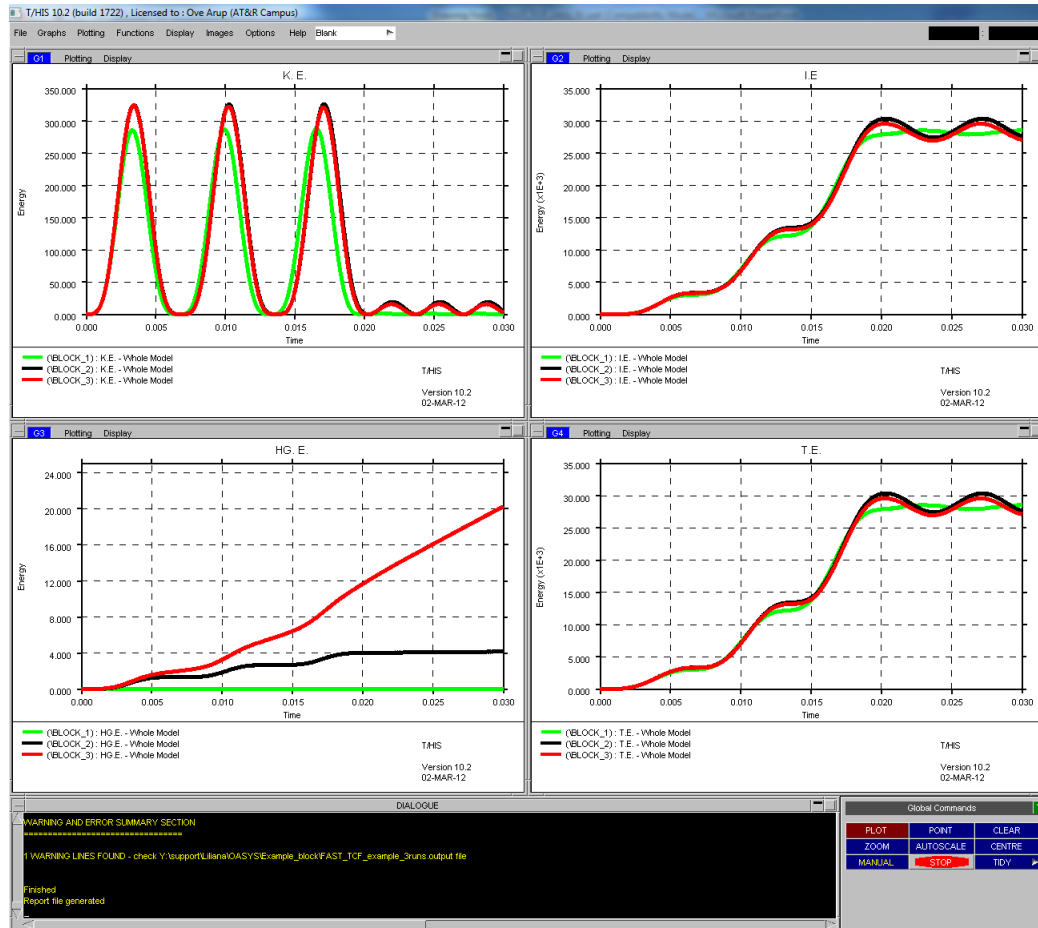
The directory names are now showed:



The screenshot shows the FAST-TCF model list. The model names are now prefixed with directory names: (\BLOCK_1), (\BLOCK_2), and (\BLOCK_3). The model names are: (\BLOCK_1) : K.E. - Whole Model, (\BLOCK_2) : K.E. - Whole Model, and (\BLOCK_3) : K.E. - Whole Model.

FAST-TCF - Example

- We are now ready to create the FAST-TCF script, which in the future can be run to rebuild this graph automatically:

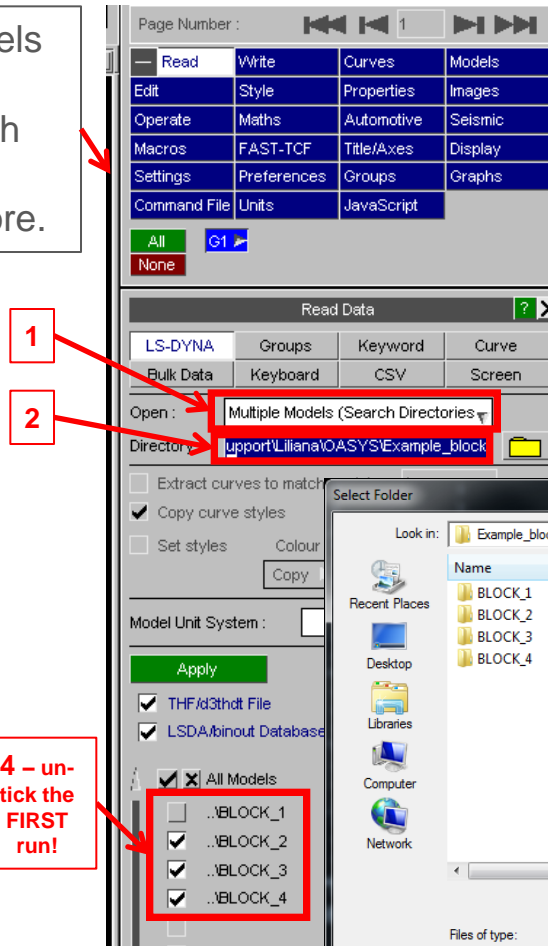


Save the FAST-TCF file as a new file, for example 'FAST_TCF_script.inp'.

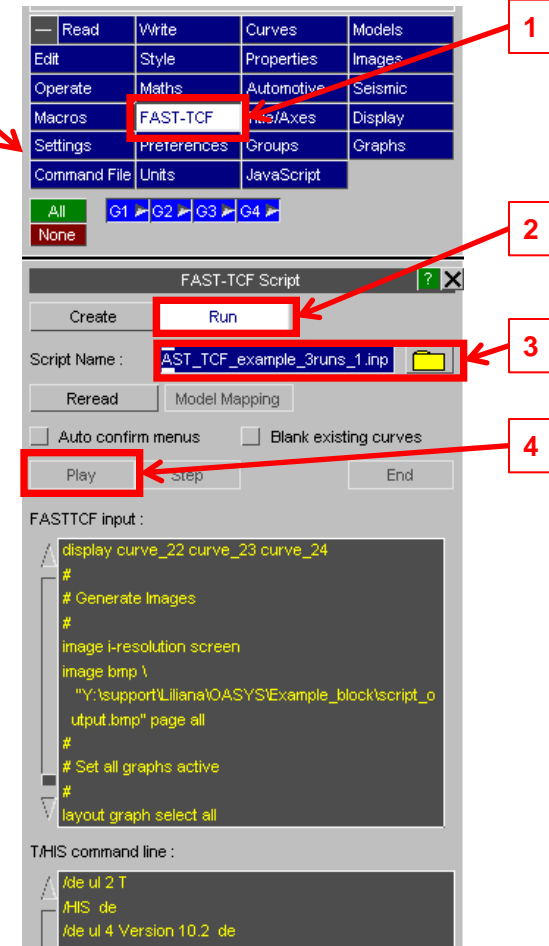
FAST-TCF - Example

- Now test the new script on a different set of runs: in a new T/HIS session, read for example BLOCK_2, BLOCK_3 and BLOCK_4.

Open the models using 'Multiple Models (Search Directories)' option, as before.

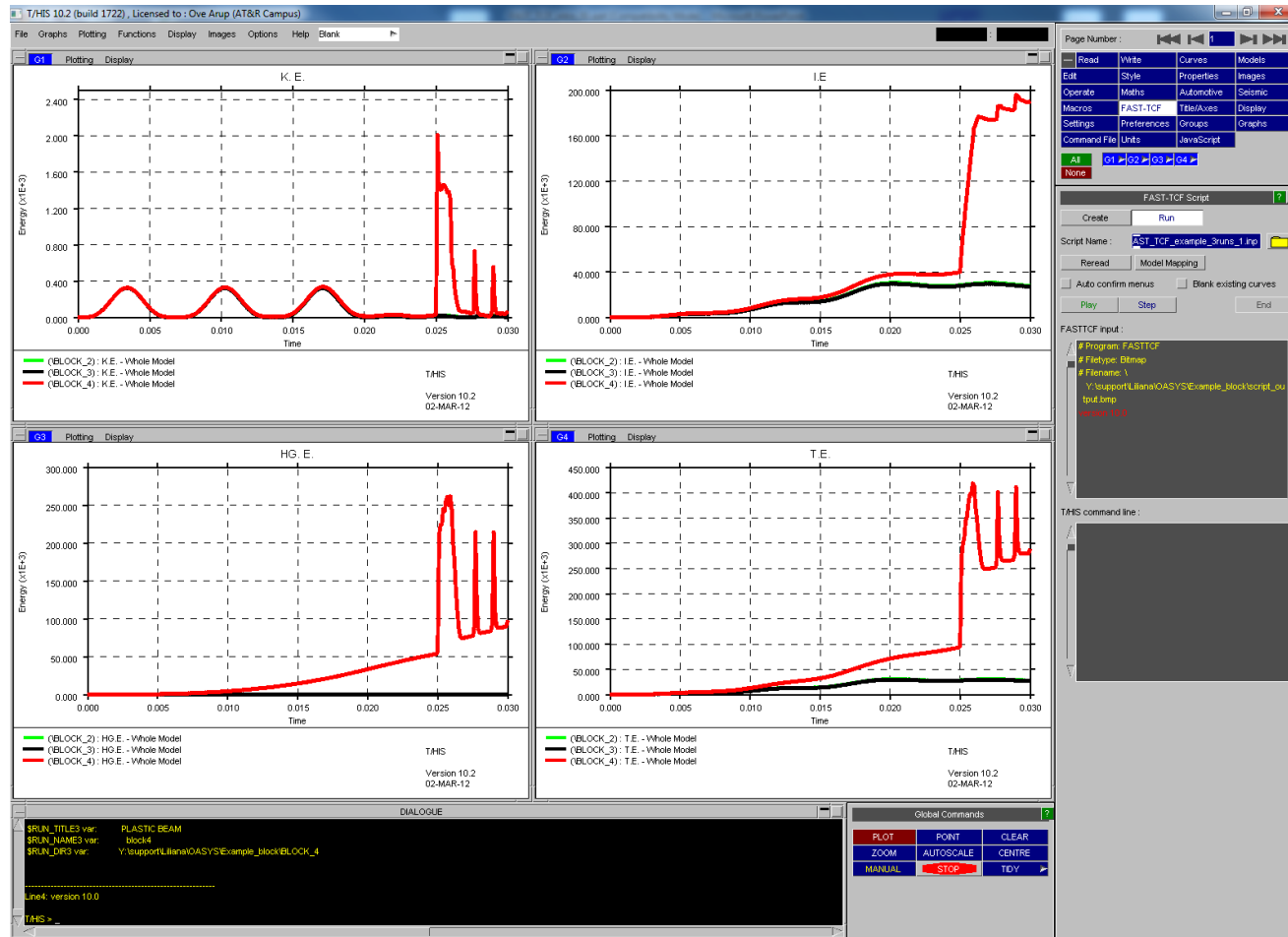


Open and run your script.



FAST-TCF - Example

- The energies for the new runs, BLOCK_2, BLOCK_3 and BLOCK_4 have been extracted:



- This script will work with different models, but only on 3 models at a time. If you want to run on a different number of models, then you have to recreate the FAST-TCF for that particular scenario.
- Alternatively, a FAST-TCF script can be created which runs only on one analysis, then re-run the script on each of the models in T/HIS.
- For more information about how to use T/HIS, please see the manual and the short introduction '*THIS_intro_2012.pdf*'.
- For more details about the FAST-TCF scripts, please see the T/HIS manual, chapter 7.

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